

IX.—A slight barometric depression moved from Virginia northeasterly up the Atlantic coast on the 28th and 29th, accompanied by rain in the New England and middle Atlantic states on the 28th, and high winds on the coast. The following maximum velocities are reported: Kitty Hawk, 35; Hatteras, 34; Delaware Breakwater, 34; Sandy Hook, 42, and Block Island, 32 miles.

#### NORTH ATLANTIC STORMS DURING MAY, 1884.

[Pressure expressed in inches and in millimetres; wind-force by scale of 0—10.]

The tracks of the atmospheric depressions that have appeared in the north Atlantic ocean during the month are approximately determined from reports of observations furnished by agents and captains of ocean steamships and sailing vessels, and from other miscellaneous data received at this office up to June 21, 1884.

The observations used are in general simultaneous, being taken each day at 7 a. m. Washington, or 12h. 8m. p. m. Greenwich, mean time.

Six depressions have been charted during the month; of these, numbers 1, 3, 5, and 6 are continuations of disturbances which passed over the United States and Canada, the two latter apparently filling up near the twenty-fifth meridian. Numbers 2 and 4 developed in mid-ocean and passed northeastward to the British coasts. With the exception of that charted as number 4, in which the wind attained a force of 8, none of the depressions have exhibited any great storm-energy. During May, 1884, fresh to strong breezes, variable in direction, with generally changeable weather, prevailed over the north Atlantic ocean. Dense fogs were of frequent occurrence over the region west of the fortieth meridian. The following are descriptions of the depressions charted:

1.—This is a continuation of the depression charted and described as low area i. under "areas of low barometer" in this REVIEW. On the morning of the 3d the centre of disturbance was near Anticosti island, Gulf of Saint Lawrence, and was enclosed by the isobar for 29.6 (751.8); during the day the disturbance moved eastward without displaying any storm-energy and by the 4th the region of least pressure was near N. 51°, W. 45°, where the barometer read 29.55 (750.6). During the 5th and 6th the depression continued to move slowly eastward, attended by moderate winds and generally fair weather in all quadrants, and by the 7th it was central off the Irish coast, causing rather strong southerly gales and rainy weather over the west of Ireland.

2.—The decrease of pressure which occurred over the region between N 40° and 45° and W. 40° and 50° during the 5th, indicated the development of a disturbance in that neighborhood. By the morning of the 6th, the barometer had fallen to about 29.6 (751.8), being a decrease of nearly .3 inch during the twenty-four hours; the winds remained light or moderate except to the westward of W. 50°, where they blew with the force of a strong breeze to moderate gale. The lowest barometric readings were reported by the following: s. s. "Illinois," W. H. Warrington, commanding, N. 44° 51', W. 39° 00', barometer 29.57 (751.1), wind ssw., force 6, weather cloudy; s. s. "State of Nevada," J. A. Stewart, commanding, N. 44° 29', W. 43° 9', barometer 29.6 (751.8) wind nnw., force 6, cloudy; vessels near the fiftieth parallel had easterly winds of force 2 to 4, with pressure about 29.6 (751.8). During the 6th, the disturbance moved northeastward with diminishing pressure and increasing storm-energy, and by the 7th, the centre was near N. 47°, W. 31°; on the forty-ninth parallel and to the northward, the easterly winds now increased to force 6-7, and the southerly and westerly winds in the vicinity of the centre attained the force of a fresh to strong gale (7-8). The following vessel-reports indicate the probable position of the storm centre: s. s. "State of Nevada," J. A. Stewart, commanding, N. 47° 35', W. 37° 54', barometer 29.08 (738.6), wind s., force 5, cloudy; s. s. "Samaria," B. Woolfenden, commanding, N. 46° 15', W. 40° 53', barometer 29.02 (737.1), wind w. by n., force 6, squally; s. s. "Polynesian," R. Brown, commanding, N. 46° 41',

W. 38° 56', barometer 29.15 (740.4), wind sw. by w., 4, cloudy; s. s. "Wyoming," J. Douglas, commanding, N. 48° 38', W. 29° 46', barometer 29.35 (745.5), wind ssw., force 6, changeable; s. s. "Scythia," M. Murphy, commanding, N. 49° 12', W. 30° 10', barometer 29.35 (745.5), wind se., force 5, raining; s. s. "Salier," C. Wiegand, commanding, N. 46° 54', W. 34° 49', barometer 29.23 (742.4), wind w. and sw., force 8; s. s. "Rugia," A. Albers, commanding, N. 45° 24', W. 34° 27', barometer 29.38 (746.2), wind sw., force 7, fair; s. s. "Normandie," G. Frangeul, commanding, N. 45° 38', W. 32° 3', barometer 29.41 (747.0), wind sw., force 7. By the morning of the 8th there was but slight change in the position of the region of least pressure, but the area of disturbance appeared to be more extended than on the preceding day; the winds continued to blow with a force of 6 to 7, with occasional squalls of force 8. By the 9th the depression had moved by a north-northeasterly course to about N. 53°, W. 25°, where the pressure, as reported, was about 29.4 (746.7); southerly and southwesterly winds of force 4 to 6 prevailed over the region east of W. 25°, with northerly and northwesterly winds of 5 to 8 between W. 30° and 45°. During the 10th and 11th the disturbance passed north-northeastward at a considerable distance from the British coasts and disappeared on the last-mentioned date.

3.—This is a continuation of the disturbance described as low area iii. under "areas of low barometer." The depression remained near the coast of Nova Scotia during the 11th and 12th, with the pressure varying from 29.0 (736.6), to 29.4 (745.7), and causing rainy weather and moderate gales over the Maritime Provinces and the Gulf of Saint Lawrence. On the 13th, the storm-centre was south of Newfoundland and moving in an easterly direction, attended by moderate westerly and northwesterly winds to the southward and westward, and light southerly winds to the eastward. During the 14th and 15th, the course changed to northeast and the disturbance passed over the ocean without manifesting any special features. On the 16th the region of least pressure was near N. 52°, W. 20°, the barometer reading about 29.6 (751.8); during the day the depression apparently passed northeastward over the British Isles.

4.—This disturbance appeared in mid-ocean on the 12th; on that day the pressure near N. 48°, W. 34°, was about 29.3 (744.2). During the day the depression moved somewhat rapidly northeastward, with an increase of storm-energy and by the 13th, it was central off the Irish coast. The following vessel-reports indicate the character of the weather during the passage of this disturbance: Captain E. Kopff, commanding, the s. s. "Frisia," reported: "May 12th, between N. 49° and 48°, and W. 24° and 28°, had a moderate gale from sw. shifting to nw. and lasting 12 hours; at noon, Greenwich time, barometer 29.85 (758.2), rainy; 2 p. m., 29.69 (754.1), rainy; 4 p. m., 29.39 (746.5), squally; 6 p. m., 29.41 (747.0), wind shifting; 8 p. m., 29.57 (751.1), midnight, 29.83 (757.7), weather clearing, wind moderating." Captain W. McMickan, commanding, the s. s. "Gallia," reported as follows: "12th, heavy gale commenced about 9 p. m., with violent squalls veering from s. to wnw., and continued all night; split several sails; 13th, 6 a. m., furious squalls with high sea breaking over the ship fore and aft and doing some damage. At 4 p. m., 12th, barometer read 29.85 (758.2); 8 p. m., 29.62 (752.3), wind shifting gradually from s. to wnw., heavy squalls; midnight, barometer, 29.42 (747.3); 13th, 4 a. m., 29.57 (751.1), hard gale, furious squalls from wnw.; 8 a. m., 29.71 (754.6); 9 a. m., moderating; 10.39 a. m., N. 50° 11', W. 22° 11', barometer 30.12 (765.0); 4 p. m., 30.23 (767.8)." The steamships "Oregon" and "Hohenzollern," between N. 50°, W. 28°, and N. 48°, W. 32°, encountered strong sw. to nw. gales with very high sea on the 13th.

5.—This is a continuation of low area vi. of "areas of low barometer." On the morning of the 18th the disturbance was central between Cape Breton Island and Newfoundland the pressure at the centre being below 29.64 (752.8). During the 19th and 20th the depression apparently moved northeastward

and by the morning of the 21st, the region of least pressure was shown near N. 55° and between W. 25° and 35°, the readings ranging from 29.5 (749.3) to 29.65 (753.1), with moderate winds to the southward and eastward of the disturbance. During the 21st and 22d an area of high pressures appears to have spread westward from the European coast, and the depression gradually filled in.

6.—This is a continuation of the depression described as low area viii. under "areas of low barometer." At midnight of the 24th the storm-centre was east of Cape Breton Island, the barometer at Sidney reading 29.57 (751.1), wind se. During the 25th the depression moved northeastward and on the following day the centre was shown near N. 49°, W. 48°, where the lowest reported pressure was 29.11 (739.4); to the eastward and southeastward moderate gradients existed, so that light to fresh breezes only were reported. Over the region between N. 41° and 50°, and from W. 50° eastward to W. 35°, the barometer readings did not exceed 29.65 (753.1); west of the fiftieth meridian the gradient was somewhat steeper, so that strong northerly and northwesterly breezes to moderate gales prevailed. During the 26th and 27th the disturbance apparently moved eastward south of N. 50°; by the 28th its position was not well-defined, but the circulation of the winds indicated that it had moved south of east; by the 29th it had disappeared from the chart.

## OCEAN ICE.

Chart i. also exhibits the southern and eastern limits of icebergs observed in the north Atlantic ocean during the period from May 10th to June 10th. This chart is based on reports sent by shipmasters to this Office; reports furnished through the co-operation of the "New York Herald Weather Service," and from other data published in the "New York Maritime Register."

The southern limit of the ice-region was near N. 41° 15', while its eastern limit extended to about W. 44°; icebergs were most numerous from N. 42°, W. 50°, northward and eastward to N. 44° W. 48°. During the month of May, 1884, there appears to have been a considerable movement of ice from the northern regions, the reports showing a decided increase, both in the number and size of the icebergs observed, as compared with those of April. Phenomenally large masses of ice have been observed near the harbor of Saint John's and at other points along the coast of Newfoundland.

Compared with the chart for the preceding month (April 12–May 10), there has been no material change in the position of the southern limit, but the eastern limit has moved about one and a half degrees to the eastward of its former position, while, as above stated, the area contains more icebergs than in the previous month.

A comparison with the chart for the corresponding period in 1883, shows but a slight difference in the limits of the ice region. In May, 1883, the southern limit was about half a degree farther south than in the present year, and the eastern limit was about the same in both years, but the icebergs of the present year are more numerous and of greater size than were those of 1883.

A comparison with the chart for the corresponding period in 1882, is interesting as showing that, while the limits of the ice-region and the number and size of the bergs in May, 1884, exceeded those of May, 1883, yet they did not equal, either in extent or number, those of May, 1882. In that year ice drifted along the shores of Nova Scotia, and the port of Halifax was blocked; field-ice extended from Newfoundland to Cape Breton, and from that island southward to Halifax the coast was blocked by heavy ice. Many steamers and sailing vessels were locked in the ice at the entrance of, and in the Gulf of Saint Lawrence. In May, 1882, the southern limit of the ice-region was about one and a half degrees farther south than in the present year, while the eastern limit was in W. 43°, or about two degrees east of that for 1884. More field-ice was reported in 1882 than in 1884.

The following are the reports received up to June 21, 1884:

SAINT JOHN'S, N. F., May 30.—The sealing brig "Confederate," Capt. Thomas Greene, of Harbor Grace, with a crew of seventy-nine men, was caught in a formidable ice nip in Notre Dame bay on April 28, and thrown completely on the floor. The ship lies over on her side with her yard-arms on the ice. On May 20 five of the crew volunteered to travel to land, distant nearly twenty miles, and report the situation. They reached Twillingate, boarded the steamer "Hercules," and arrived here this evening. They report that all the provisions are consumed except bread, and the last pound of fuel is exhausted. A powerful sealing steamer will be at once dispatched to the rescue. Captain Cress, of the steamer "Hercules," reports ice to the eastward of Notre Dame bay as far as the eye can reach, and innumerable icebergs.—(*New York Journal of Commerce*.)

May 5th.—Captain D. Thoms, of the barkentine "Corisande," reported many icebergs outside the harbor of Saint John's, Newfoundland.

6th.—S. S. "Arizona," from N. 43° 02', W. 50° 05' to N. 43° 40', W. 48° 45', passed five large icebergs.

9th.—S. S. "Samarina," between N. 43° 38', W. 48° 10', and N. 43° 16', W. 49° 44', passed several large and small icebergs; s. s. "Salier," between N. 43° 29', W. 48° 16', and N. 43° 3', W. 49° 52', passed several icebergs; s. s. "Brooklyn," passed the first iceberg in N. 46° 55', W. 47° 54'; several others in sight; last ice seen in N. 46° 10', W. 50° 28'.

10th.—S. S. "Wyoming," in N. 43° 32', W. 48° 11', passed two small icebergs and several small pieces; also at noon, in N. 43° 18', W. 49° 21', passed a large iceberg; 1.30 p. m., in N. 43° 4', W. 49° 48', passed a large iceberg about 150 feet high; 5 p. m., in N. 43° 0', W. 51° 3', passed a small iceberg.

13th.—S. S. "Hammonia," in N. 42° 39', W. 48° 31', passed two icebergs.

15th.—S. S. "Oregon," in N. 43° 29', W. 49° 38', passed several pieces of ice; s. s. "Britannic," in N. 44° 35', W. 49° 08', passed two large icebergs.

19th.—S. S. "Assyrian Monarch," in N. 48° 19', W. 45° 45', passed two large icebergs, one of which was a mile long.

20th.—S. S. "Sarnia," between N. 46° 40', W. 53° 10' and N. 47° 10', W. 51° 30', passed several large icebergs.

21st.—Ship "Terpsichore," in N. 46° 30', W. 48° 30', passed five large icebergs; s. s. "Salerno," in N. 42° 50', W. 48° 20', passed an iceberg about 150 feet high; s. s. "Eider," at 4.25 a. m. in N. 42° 57', W. 49° 2', passed south of two large icebergs, which proved to be about six hundred feet long and twenty feet above water.

22d.—S. S. "Arizona," in N. 44° 50', W. 45° 40', passed an iceberg; also, in N. 44° 45', W. 45° 53', passed another.

23d.—S. S. "Aurania," in N. 47° 02', W. 50° 28', passed two icebergs bearing thirteen miles north; ship "Cheseborough," in N. 45°, W. 45°, passed a large iceberg. A gigantic iceberg ran ashore in Saint John's bay on the morning of the 23d. An iceberg estimated at not less than seven miles long was seen passing southward at a distance of forty miles from Saint John's. A large iceberg nine and a fourth miles in length was reported thirty miles off Southern Gravis island, Newfoundland. S. S. "Circassian," in N. 46° 51', W. 52° 38', passed several icebergs and loose pieces of ice; at 6.45 a. m., passed Cape Race and saw several bergs and loose pieces of ice.

24th.—S. S. "State of Florida," in N. 43° 30', W. 44° 50', passed an iceberg; s. s. "Hibernian," in N. 43° 00', W. 48° 56', passed several pieces of ice; s. s. "Saint Laurent," between N. 43° 03', W. 48° 42' and N. 42° 52', W. 50° 07', passed two icebergs; s. s. "Wyoming," in N. 42° 13', W. 50° 44', passed an iceberg and several small pieces, also in N. 42° 30', W. 48° 54', passed a very large iceberg.

25th.—S. S. "Rhein," in N. 43° 39', W. 48° 40', passed two large icebergs; s. s. "State of Nevada," in N. 42° 22', W. 49° 11', passed an iceberg; ship "Cheseborough" in N. 44° W. 49° passed a large iceberg; s. s. "Wyoming," in N. 43° 29', W. 44° 50', passed a low iceberg.

26th.—S. S. "Heckla" in 42° W. 50°, passed several icebergs.

27th.—Bark "Fluorine," in N. 45° 24', W. 53° 25', passed

a large iceberg and several pieces of field-ice; s.s. "Brooklyn" saw several icebergs off Cape Race; last ice seen in N. 47° 24', W. 49° 26'; bark "Esmeralda," in N. 46° W. 50°, passed four small icebergs; s.s. "Salier," between N. 42° 16', W. 50° 42' and N. 42° 47', W. 47° 53', passed eleven large icebergs and some smaller ones.

28th.—S. S. "City of Chester," in N. 42° 11', W. 48° 49', passed an iceberg and several pieces of ice.

29th.—S. S. "Westphalia," in N. 41° 42', W. 47° 47', passed a large iceberg.

30th.—S. S. "Alaska," in N. 43° 37', W. 48° 03', passed an iceberg, also in N. 43° 27', W. 48° 17' passed another; s. s. "Weser," in N. 41° 30', W. 47° 30', passed a small iceberg.

June 1st.—S. S. "Furnessia," in N. 43° 01', W. 49° 43', passed an iceberg; s. s. "Nürnberg," between N. 42° 56', W. 48° 11' and N. 42° 54', W. 48° 32', passed several icebergs.

2d.—S. S. "Pieter de Coninck," in N. 44° 34', W. 49° 10', passed an iceberg.

5th.—S. S. "City of Rome," in N. 44° 36', W. 47° 35', passed two large icebergs; s. s. "Critic," in N. 41° 30', W. 48° 51', passed several icebergs.

6th.—S. S. "Grecian Monarch," in N. 46° 23', W. 50° 27', passed two icebergs and several pieces of ice; s. s. "Brooklyn City," in N. 44° 06', W. 55°, passed a large iceberg; s. s. "Rhætia," in N. 42° 34', W. 50° 23', passed two large icebergs about one hundred to one hundred and fifty feet high; s. s. "Justitia," in N. 42° 15', W. 48° 04', passed a large iceberg with floating ice around it.

### TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

The distribution of mean temperature over the United States and Canada for May, 1884, is exhibited on chart ii. by the dotted isothermal lines.

In the following table are shown the normal temperatures for May, the mean temperatures for May, 1884, and the departures from the normal, in the several geographical districts, as deduced from the records of the Signal Service:

Average temperatures for May, 1884.

Districts.	Average for May, Signal-Service observations.		Comparison of May, 1884, with the average for several years.
	For several years.	For 1884.	
New England.....	54.5	53.6	0.9 below.
Middle Atlantic states.....	51.1	51.9	0.8 above.
South Atlantic states.....	69.7	71.6	1.9 above.
Florida peninsula.....	76.9	78.1	1.2 above.
Eastern Gulf states.....	72.6	73.0	0.4 above.
Western Gulf states.....	73.6	72.2	1.4 below.
Rio Grande valley.....	80.6	78.4	2.2 below.
Tennessee.....	69.1	68.5	0.6 below.
Ohio valley.....	65.3	63.7	1.6 below.
Lower lake region.....	56.5	55.3	1.2 below.
Upper lake region.....	51.7	51.2	0.5 below.
Extreme northwest.....	53.0	53.5	0.5 above.
Upper Mississippi valley.....	62.0	61.8	0.2 below.
Missouri valley.....	61.4	60.1	1.3 below.
Northern slope.....	52.7	53.5	0.8 above.
Middle slope.....	61.4	58.4	3.0 below.
Southern slope.....	71.9	65.8	5.1 below.
Southern plateau.....	68.5	65.5	3.0 below.
Northern plateau.....	55.8	61.0	5.2 above.
North Pacific coast region.....	54.8	58.2	3.4 above.
Middle Pacific coast region.....	62.0	63.4	1.4 above.
South Pacific coast region.....	66.9	66.1	0.8 below.
Mount Washington, N. H.....	33.5	32.0	1.5 below.
Pike's Peak, Colo.....	22.1	20.4	1.7 below.
Salt Lake City, Utah.....	57.9	57.7	0.2 below.

The month was warmer than the average in the states bordering on the Atlantic south of New England, in the east Gulf states, north and middle Pacific coast regions, northern plateau, northern slope, and extreme northwest. In the districts above-named the mean temperature of May exceeded the normal, as follows: middle Atlantic and east Gulf states, extreme northwest and northern slope from 0°.4 to 0°.8; south Atlantic states, Florida peninsula, and middle Pacific coast region,

from 1°.2 to 1°.9; north Pacific coast region and northern plateau, from 3°.4 to 5°.2. In all other portions of the country the month was colder than the average, the deficiencies in the mean temperatures being less than 1° in southern California, the upper lake region, Tennessee, and the upper Mississippi valley, the average in the last-named districts being only 0°.2 below the normal. The most marked deficiencies occurred in the middle and southern slopes, and southern plateau, where they varied from 3° to 5°.

The following are some of the highest and lowest monthly mean temperatures reported from the Signal Service stations:

Stations reporting highest.	Stations reporting lowest.
Key West, Florida..... 80.9	Pike's Peak, Colorado..... 20.4
Rio Grande City, Texas..... 80.1	Mount Washington, New Hampshire... 32.0
Cedar Keys, Florida..... 77.0	Eastport, Maine..... 45.5
Brownsville, Texas..... 76.7	Marquette, Michigan..... 47.2
Jacksonville, Florida..... 75.5	Mackinaw City, Michigan..... 47.7
New Orleans, Louisiana..... 76.4	Alpena, Michigan..... 48.5
Savannah, Georgia..... 76.1	Duluth, Minnesota..... 48.9
Galveston, Texas..... 75.9	Escanaba, Michigan..... 49.1
Indianola, Texas..... 75.4	Deadwood, Dakota..... 49.2
Yuma, Arizona..... 75.3	Cheyenne, Wyoming..... 49.6
Charleston, South Carolina..... 74.8	Fort Maginnis, Montana..... 50.6
Mobile, Alabama..... 74.6	Buffalo, New York..... 52.1
Montgomery, Alabama..... 74.6	Fort Shaw, Montana..... 53.0

### DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of comparative temperatures for May, 1884. Voluntary observers report the following notes in connection with this subject:

**Arkansas.**—Lead Hill, Boone county: mean temperature, 67°.8, is 3°.1 above the May average of the last two years.

**Dakota.**—Webster, Day county: mean temperature, 57°.6, is 6°.2 above that for May, 1883.

**Illinois.**—Riley, McHenry county: mean temperature, 57°.0, is 0°.3 above the May average of the last twenty-three years. The mean temperature of the spring season of 1884, is 43°.3, or 0°.3 below the mean of the corresponding period of the last twenty-three years.

**Swanwick, Perry county:** mean temperature, 63°.5, is 0°.2 above the May average of the last three years.

**Mattoon, Coles county:** mean temperature, 66°.0, is 0°.5 above the May average of the last five years.

**Anna, Union county:** mean temperature, 65°.5, is 1°.7 below the May average of the last nine years.

**Indiana.**—Logansport, Cass county: mean temperature, 62°.0, is 2°.4 below the May average of the last twenty-five years. During that period the average maximum temperature was 91°.1, the highest being 99° in 1870 and 1881, and the lowest maximum, 83°, occurred in 1861. The average minimum temperature was 38°.6, the lowest being 28°, which occurred in 1876 and 1877.

**Vevay, Switzerland county:** mean temperature, 64°.4, is 1°.0 below the May average of the last twenty years.

**Wabash, Wabash county:** mean temperature, 61°.6, is 0°.5 below the May average of the last eight years.

**Lafayette, Tippecanoe county:** mean temperature, 59°.5, is 2°.9 below the May average of the four preceding years; the mean temperature of the spring of 1884, is 49°.3 or 0°.4 below the average of the corresponding seasons of the same period.

**Kansas.**—Independence, Montgomery county: mean temperature, 63°.8, is 2°.1 below the May average of the last thirteen years.

**Lawrence, Douglas county:** mean temperature, 62°.2, is 3°.6 below the May average of the last seventeen years.

**Wellington, Sumner county:** mean temperature, 60°.2, is 2°.9 below the May average of the last six years.

**Maine.**—Gardiner, Kennebec county: mean temperature, 51°.2, is 2°.3 below the May average of the last forty-eight years.

**Maryland.**—Fallston, Harford county: mean temperature, 60°.5, is 0°.4 below the May average of the last thirteen years.